

R&S®FSVR

Real-Time Spectrum Analyzer

Instrument Security Procedures



1173.1333.52 – 03



ROHDE & SCHWARZ

Instrument Security Procedures

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1 Overview

In many cases, it is imperative that the R&S FSVR Real-Time Spectrum Analyzers are used in a secured environment. Generally these highly secured environments do not allow any test equipment to leave the area unless it can be proven that no user information leaves with the test equipment. Security concerns can arise when devices need to leave a secured area e.g. to be calibrated or serviced.

This document describes the types of memory and their usage in the R&S FSVR. It provides a statement regarding the volatility of all memory types and specifies the steps required to declassify an instrument through memory clearing or sanitization procedures. These sanitization procedures are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS).

2 Instrument Models Covered

Table 2-1: Real-Time Spectrum Analyzer models

Product name	Order number
R&S FSVR7	1311.0006.07
R&S FSVR13	1311.0006.13
R&S FSVR30	1311.0006.30
R&S FSVR40	1311.0006.40

3 Security Terms and Definitions

Clearing

The term "clearing" is defined in Section 8-301a of DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)". Clearing is the process of eradicating the data on media so that the data can no longer be retrieved using the standard interfaces on the instrument. Therefore, clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.

Sanitization

The term "sanitization" is defined in Section 8-301b of DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)". Sanitization is the process of removing or eradicating stored data so that the data cannot be recovered using any known technology. Instrument sanitization is typically required when an instrument is moved from a secure to a non-secure environment, such as when it is returned for service of calibration.

The memory sanitization procedures described in this document are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS). These requirements are specified in the "Clearing and Sanitization Matrix" in Section 14.1.16 of the ISFO "Manual for the Certification and Accreditation of Classified Systems under the NISPOM".

Instrument declassification

The term "instrument declassification" refers to procedures that must be undertaken before an instrument can be removed from a secure environment, for example when the instrument is returned for calibration. Declassification procedures include memory sanitization or memory removal, or both. The declassification procedures described in this document are designed to meet the requirements specified in DoD 5220.22-M, "National Industrial Security Program Operating Manual (NISPOM)", Chapter 8.

4 Types of Memory and Information Storage in the R&S FSVR

The Real-Time Spectrum Analyzer contains various memory components.

The following table provides an overview of the memory components that are part of your instrument. For a detailed description regarding type, size, usage and location, refer to the subsequent sections.

Memory type	Size	Content	Volatility	User data	Sanitization procedure
SDRAM (CPU board)	4 Gbyte	Temporary information storage for operating system and instrument firmware	Volatile	Yes	Turn off instrument power
SDRAM/DDR3 (detector board)	2 Gbyte	Measurement data (I/Q data, spectra, histogram)	Volatile	Yes	Turn off instrument power
SDRAM/DDR3 (detector extension board)	3 x 2 Gbyte				
SDRAM/DDR2 (detector extension board)	2 x 64 Mbyte				
EEPROM (board assembly)	32 kbyte up to 1 Mbyte	Hardware information: <ul style="list-style-type: none"> Serial number Product options Calibration correction data 	Non-volatile	No	None required (no user data)
Flash (CPU board)	512 kbyte	BIOS	Non-volatile	No	None required (no user data)
Hard disk drive (HDD) (removable) or Solid-state drive (SSD) (removable)	8 Gbyte / 32 Gbyte / 64 Gbyte	<ul style="list-style-type: none"> Operating system Instrument firmware Instrument states and set-ups Limit lines and transducer tables Trace data Measurement results and screen images 	Non-volatile	Yes	Remove HDD from instrument or Remove SSD from instrument

4.1 Volatile Memory

The volatile memory in the instrument does not have battery backup. It loses its contents as soon as power is removed from the instrument. The volatile memory is not a security concern.

Removing power from this memory meets the memory sanitization requirements specified in the "Clearing and Sanitization Matrix" in section 5.2.5.5.5 of the ISFO Process Manual for the Certification and Accreditation of Classified Systems under the NIS-POM.

SDRAM

The SDRAM on the CPU board has a size of 4 Gbyte and contains temporary information storage for operating system and instrument firmware. The SDRAM loses its memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

SDRAM/DDR3/DDR2

The SDRAM/DDR3 on the detector board has a size of 2 Gbyte.

In addition, the R&S FSVR is equipped with 3 x 2 Gbyte SDRAM/DDR3 and 2 x 64 Mbyte SDRAM/DDR2 on the detector extension board.

The SDRAM/DDR3 and SDRAM/DDR2 contain measurement data like I/Q data, spectra and histograms. They lose their memory as soon as power is removed.

Sanitization procedure: Turn off instrument power

4.2 Non-Volatile Memory

The R&S FSVR contains various non-volatile memories. Out of these, only the removable hard disk drive / solid-state drive (HDD/SSD) contains user data. The HDD/SSD can be physically removed from the R&S FSVR and left in the secure area.

All non-volatile memories of the R&S FSVR are not a security concern.

EEPROM

Each board assembly in the R&S FSVR Real-Time Spectrum Analyzer has one serial EEPROM device with a size of 32 kbyte up to 1 Mbyte. The EEPROM contains information related to the installed hardware, such as board serial number, product options and calibration correction data. The EEPROM does not hold user data nor can the user access the EEPROM storage.

Sanitization procedure: None required (no user data)

Flash

The CPU board of the R&S FSVR Real-Time Spectrum Analyzer has one 512 kbyte flash memory device. It contains the BIOS. The flash memory does not hold user data nor can the user access the flash memory.

Sanitization procedure: None required (no user data)

Hard disk drive (HDD) / solid-state drive (SSD)

The removable HDD/SSD is located on the rear of the R&S FSVR. Its size depends on the model you have ordered.

The HDD/SSD is used to store:

- Operating system
- Instrument firmware and firmware options (measurement personalities) with option license keys
- Instrument states and setups
- Trace data
- Limit lines, transducer tables
- Screen images

The HDD/SSD holds user data and is non-volatile. Hence, user data is not erased when power is removed from the instrument.

The removable HDD/SSD can be removed from the Real-Time Spectrum Analyzer to make sure that no user data is stored within the Real-Time Spectrum Analyzer. This can be done without opening the instrument.

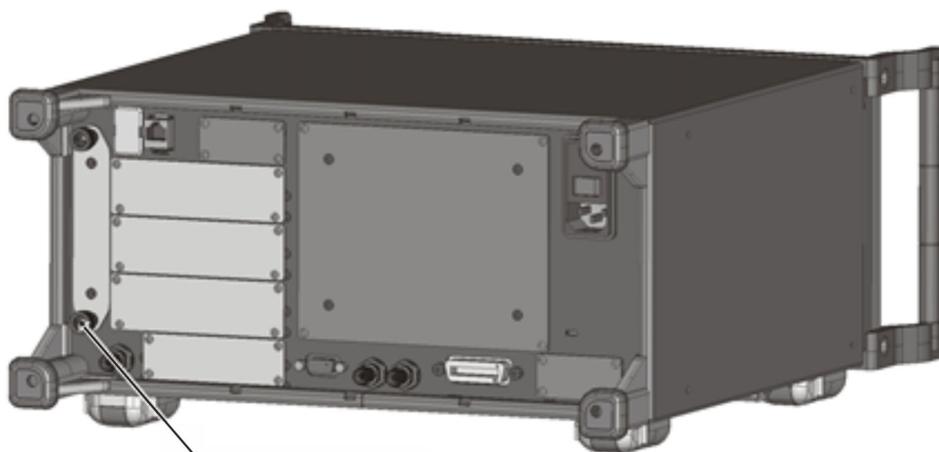
The R&S FSVR, equipped with the removable HDD/SSD, addresses the needs of customers working in highly sensitive areas.

Sanitization procedure: Remove HDD or SSD from instrument

5 Instrument Declassification

Before you can remove the Real-Time Spectrum Analyzer from a secured area (for example to perform service or calibration), all classified user data needs to be removed. You can declassify the Real-Time Spectrum Analyzer as follows:

1. Turn off the Real-Time Spectrum Analyzer and disconnect the power plug. This will sanitize the volatile memory.
2. To remove the HDD/SSD (containing user data), perform the following steps:
 - a) Locate the HDD/SSD.



Hard Disk Drive/Solid-State Drive

Figure 5-1: Location of the hard disk drive / solid-state drive

- b) Unscrew the two knurled screws.
- c) Remove the HDD/SSD on the rear panel of the R&S FSVR.

Following these steps removes all user data from the Real-Time Spectrum Analyzer. The Real-Time Spectrum Analyzer can now leave the secured area.

These declassification procedures meet the needs of customers working in secured areas.

Once the R&S FSVR is outside the secured area, installing a second non-classified removable HDD/SSD (without any user data) allows the R&S FSVR to function properly for service or other needs.

Prior to re-entering the secured area, remove the non-classified removable HDD/SSD (without the user data). When the R&S FSVR is back within the secured area, the original classified removable hard disk drive / solid-state drive can be reinstalled.

- To hold classified user data in secure areas, use the removable hard disk drive / solid-state drive which comes with the instrument.
- To hold non-classified user data in non-secure areas, use a second removable hard disk drive / solid-state drive (R&S FSVR-B18/-B19).

Validity of instrument calibration after declassification

The calibration makes sure that measurements comply to government standards. Rohde & Schwarz recommends that you follow the calibration cycle suggested for your instrument.

The EEPROM is the only memory type used to hold permanent adjustment values required to maintain the validity of the R&S FSVR's calibration. Therefore, replacing one removable HDD/SSD with another does not affect the validity of the instrument calibration.

After exchanging the removable HDD/SSD, perform a self-alignment once:



Note that the instrument has sufficient warm-up time before you perform the self-alignment.

1. Select the SETUP key.
2. Select the "Alignment" softkey.
3. Select "Start Self Alignment"

This function uses the high-stability internal reference generator to produce the temporary adjustment values. Using the permanent and temporary values, the necessary adjustment information is then stored on the removable HDD/SSD. Rohde & Schwarz recommends that you perform the self-alignment function once a week.

6 Special Considerations for USB Ports

USB ports can pose a security risk in high-security locations. Generally, this risk comes from small USB pen drives, also known as memory sticks or key drives. They can be easily concealed and can quickly read/write several Gbyte of data.

Disabling USB ports for writing user data

You can disable the write capability on the USB ports of the R&S FSVR R&S FSVR via a utility software. This utility software is available on the R&S FSVR website <http://www.rohde-schwarz.com/product/fsvr.html>.

To disable the write capability, copy the utility software to the R&S FSVR and run it once. After a reboot of the instrument, the write capability on any USB memory device is disabled.

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